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10/563,436	01/05/2006	Katsushige Amano	2005_1991A	4368

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WENDEROTH, LIND & PONACK L.L.P.
1030 15th Street, N.W.
Suite 400 East
Washington, DC 20005-1503

EXAMINER

BRYANT, DOUGLAS J.

ART UNIT	PAPER NUMBER
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2195

NOTIFICATION DATE	DELIVERY MODE
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02/23/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ddalecki@wenderoth.com
coa@wenderoth.com

Office Action Summary	Application No. 10/563,436	Applicant(s) AMANO ET AL.	
	Examiner DOUGLAS BRYANT	Art Unit 2195	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 16, 18, 22, 25, 28-29, and 31-34 are pending in this application.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 16, 18, 22, 25, 28, and 31-34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Clearly.

A. The claim language in the following claim is unclear and indefinite.

(i) As per claim 16, line 16, it is not clearly indicated what a variable priority is, does each signal-handle processing task (SHPT) has a different priority or does each SHPT has a variable priority that constantly changes?

(ii) As per claim 34, lines 1-6, it claims a computer readable storage media, but it states the "computer functioning as:", it is not clearly indicated whether this is a computer product claim or "computer functioning claim" (i.e. method claim)?

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2195

3. Claims 16, 18, 22, 25, 28, 29, and 31-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rankin et al. (Rankin) US Patent Application 2003/0061423 A1 in view of Kling et al. (Kling) US Patent 6,662,203 B1, and further in view of Takeuchi et al. (Takeuchi) US Patent 5,944,778.

4. Rankin et al, Kling et al, and Takeuchi et al were cited in the last office action.

5. As to claim 16, Rankin teaches a task scheduling apparatus for parallel processing a plurality of tasks, each of the tasks being assigned a priority and the plurality of tasks including one or more tasks each having one or more signal handlers assigned a priority, the task scheduling apparatus comprising:

a signal-handler registering section for registering the one or more signal handlers of the one or more tasks, signals corresponding to the one or more signal handlers, and the priorities assigned to the one or more signal handlers while relating them to each other (**Para 27, lines 10-15; Fig 2; [Task Priority Table]**).

a signal generating section for generating a signal for designating a signal handler (**Para. 27, lines 16-18**);

a priority table for recording the plurality of tasks and the priorities thereof while relating them to each other, wherein the plurality of tasks include a signal-handler processing task which is assigned with a variable priority (**Enable**), includes a queue in which at least one signal handler to be executed is registered, and causes executed a highest priority handler having a highest priority out of the at least one signal handler registered in the queue upon being called and executed (**Para 27, lines 10-15; Fig 2; [Task Priority Table]**);

Art Unit: 2195

the selection executing section includes: a signal notifying section for specifying the object signal handler by referring to contents registered by the signal-handler registering section(**Para. 27, lines 13-15**) and registering the object signal handler in the queue (**Para. 27, lines 10-13**).

6. Rankin is silent to the fact of a selection executing section for specifying an object signal handler as a signal handler corresponding to the generated signal and a priority thereof by referring to contents registered by the signal-handler registering section, and executing the one having a highest priority out of the plurality of tasks and the object signal handler and a selection executing section for specifying an object signal handler as a signal handler corresponding to the generated signal and a priority thereof by referring to contents registered by the signal-handler registering section and executing the one having a highest priority out of the plurality of tasks and the object signal handler.

7. However, Kling teaches a selecting section for selecting the task corresponding to the highest one of a plurality of priorities recorded in the priority table as an object to be executed by referring to the priority table (**Col 2, lines 42-48**), and an executing section for executing the task selected by the selecting section(**Col 3, lines 30-42**).

8. It would have been obvious to one of an ordinary skill in the art at the time of the invention was made to combine the teachings of Kling with the teachings of Rankin to have a selection executing section (**scheduler**) refer to the task priority table to select the task with the

Art Unit: 2195

highest priority preventing the delay of high priority tasks. This modification would efficiently utilize the parallel execution capacity of the system.

9. Rankin and Kling are both silent to the teachings of a priority changing section for specifying the highest priority handler out of the at least one signal handler registered in the queue by referring to the contents registered by the signal-handler registering section when the content registered in the queue has been changed and changing the priority of the signal-handler processing task recorded in the priority table to the priority of the specified highest priority handler.

10. However Takeuchi teaches a priority changing section for specifying the highest priority handler out of the at least one signal handler registered in the queue by referring to the contents registered by the signal-handler registering section when the content registered in the queue has been changed (**Para 27, lines 10-15; Fig 2. Task Priority Table**) and changing the priority of the signal-handler processing task recorded in the priority table to the priority of the specified highest priority handler (**Col 4, lines 54-67**).

11. It would have been obvious to one of an ordinary skill in the art at the time of the invention was made to combine the teachings of Takeuchi into those of Rankin and Kling to have a priority changing section to change the priority of the object task in the priority table to ensure that the task with the highest priority is executed on schedule prevention a processing delay.

12. As per claim 18, Kling teaches a task scheduling apparatus according to claim 16, wherein the signal notifying section deletes, from the priority table, recorded content relating to task whose execution has been completed when the executing section completes the execution of the task **(Col 7, line 46-48; it is understood once the job has completed, it is removed from the table).**

13. As to claim 22, Kling teaches a task scheduling apparatus according to claim 16, wherein the signal-handler processing task deletes, from the queue, registration of the highest priority handler whose execution has been completed from the queue when the execution of the highest priority handler is completed **(Col 7, line 46-48; it is understood that the signal-handler associated with the task is removed from the queue when the task has completed and has been removed from the queue).**

14. As to claim 25, Rankin teaches a task scheduling apparatus according to claim 16, further comprising a task registering section for registering the priorities of the one or more tasks in the priority table upon a registration instruction from the one or more tasks **(Para 25, lines 20-24; interrupt controller comprises task priority table).**

15. As to claim 28, Rankin teaches a task scheduling apparatus according to claim 25, wherein the task registering section changes the priorities of the one or more tasks registered in the priority table upon a change instruction from the one or more tasks **(Para 28, lines 5-9).**

16. As per claim 29, Rankin teaches a task scheduling apparatus according to claim 26, further comprising:

a signal-handler registering section for registering the one or more signal handlers of the one or more tasks, signals corresponding to the one or more signal handlers, and the priorities assigned to the one or more signal handlers while relating them to each other (**Para 27, lines 10-15; Fig 2; [Task Priority Table]**).

a signal generating section for generating a signal for designating a signal handler (**Para. 27, lines 16-18**);

a task registering section for registering the priorities of the one or more tasks in the priority table upon a registration instruction from the one or more tasks (**Para 25, lines 20-24; interrupt controller comprises task priority table**),

a priority table for recording the plurality of tasks and the priorities thereof while relating them to each other, (**Para 27, lines 10-15; Fig 2; [Task Priority Table]**);

the selection executing section includes: a signal notifying section for specifying the object signal handler by referring to contents registered by the signal-handler registering section(**Para. 27, lines 13-15**) and registering the object signal handler in the queue (**Para. 27, lines 10-13**).

the signal generating section generates a signal corresponding to the specific signal handler upon receiving the notification (**Para 27, lines 10-15; Fig 2; [Task Priority Table]**).

Art Unit: 2195

Kling teaches a buffer for temporarily storing data outputted from a specific task which is one of the one or more tasks **(Col 6, lines 20-22)**, and

a buffer administering section for making a notification to the signal generating section when an amount of the data stored in the buffer falls below a predetermined reference amount **(Col 7, lines 61-65)**,

Takeuchi teaches wherein the specific task includes a specific signal handler for causing the task registering section to change the priority of the specific task registered in the priority table to a higher value by giving an instruction to the task registering section **(Col 6-7, lines 66-4)**,

wherein the task registering section changes the priorities of the one or more tasks registered in the priority table upon a change instruction from the one or more tasks **(Col 6, lines 66– line 4, Col 7)**;

17. As to claim 31, Kling teaches a task scheduling apparatus according to claim 28, further comprising:

a buffer for temporarily storing data outputted from a specific task, the specific task being one of the one or more tasks **(Col 6, lines 20-22)**, and

a buffer administering section for notifying the signal generating section when an amount of the data stored in the buffer falls below a predetermined reference amount **(Col 7, lines 61-65)**.

Takeuchi teaches wherein the specific task includes a specific signal handler for causing the task registering section to change the priority of the specific task registered in the priority

Art Unit: 2195

table to a higher value by giving an instruction to the task registering section (**Col 6-7, lines 66-4**).

Rankin teaches the signal generating section generates a signal corresponding to the specific signal handler upon receiving the notification from the buffering administering section (**Para 27, lines 10-15; Fig 2; [Task Priority Table]**).

18. As per claim 32, Rankin teaches a task scheduling apparatus according to claim 16, further comprising a signal-handler table in which the signal-handler registering section registers the one or more signal handlers of the one or more tasks, the signals corresponding to the respective signal handlers and the priorities of the respective signal handlers while relating them to each other (**Para 27, lines 10-15; Fig 2. Task Priority Table**),

Kling teaches wherein the selection executing section (**processing core**) refers to the signal-handler table as the contents registered by the signal-handler registering section (**Col 3, lines 30-42**).

19. As to claims 33 and 34, they are rejected on the same rationale as claim 1.

Response to Arguments

20. Applicant's arguments filed 12/03/2009 have been fully considered but they are not persuasive.

21. In the remarks, applicant argues:

- i. Rankin and Takeuchi fails to teach a signal-handler processing task is assigned a variable priority, includes a queue in which at least one signal handler to be executed is registered, and the signal-handler processing task causes to be executed a signal handler having a highest priority out of the at least one signal handler registered in the queue upon the signal-handler processing task being called and executed.
- ii. Rankin and Takeuchi fails to teach a signal notifying section for specifying a signal handler designated by a generated signal as an object signal handler and assigning a priority to the object signal handler by referring to contents registered by the signal-handler registering section, and registering the object signal handler in the queue.
- iii. Rankin and Kling fails to teach changing a variable priority of the signal-handler processing task recorded in a priority table to a priority of the specified highest priority signal handler.
- iv. Rankin and Takeuchi fails to disclose or suggest a buffer for temporarily storing data outputted from a specific task.
- v. Rankin and Takeuchi fails to teach a signal generating section generates a signal corresponding to the specific signal handler upon receiving the notification from the buffer administering section.

Art Unit: 2195

22. Examiner respectfully disagrees with applicant:

As to point (i), Kling clearly states in the abstract that the signals and processes in this multiprocessing system are scheduled in order of their priority and it is stores them in a queue. This implies that these signal handlers and process are in fact executed when having the highest priority.

As to point (ii), Kling states that the process signals that correlate to corresponding processes which implies that the when the signal handler is assigned a priority, it is place in a process handler (queue) and it is placed with a process that has some type of similar relationship and it is registered in the queue because it is giving a priority level so that it may be executed.

As to point (iii), Takeuchi states that a periodic process is driven preferentially by a change of priority conducted by the periodic kernel processes and each periodic process is associated with a signal handler. This implies that when the periodic process priority changes, the signal handler associated to this particular process changes also.

As to point (iv), Kling states that a dependency checking unit and temporary write queue (*buffer*) handles all of the data dependencies (**Col 6, lines 15-19**), that will be executed in the execution pipelines. The dependency data will is outputted data from specific tasks that will be used in the execution of other tasks in the execution pipelines.

As to point (v), Kling clearly teaches once a signal has been removed from the queue, new signals are to be buffered into the queue (**Col7, lines 61-65**). Rankin clearly teaches a signal corresponding to the signal handler informing the system that this particular handler is ready to be executed (**Para 27, lines 10-15**). Notifying the system that a specific signal handler is enable and ready to execution, is understood to be corresponding to a specific signal handler and not just any signal handler in the queue.

Conclusion

2. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).
3. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.
4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DOUGLAS BRYANT whose telephone number is (571)270-7707. The examiner can normally be reached on M-F 8:00-5:00pm Est.

Art Unit: 2195

5. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, An Meng-ai can be reached on 571-272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.
6. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DOUGLAS BRYANT/
Examiner, Art Unit 2195